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UNITED STATES DISTRICT COURT

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NORTHERN DISTRICT OF CALIFORNIA, SAN FRANCISCO DIVISION

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WAYMO LLC,

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Plaintiff,

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vs.

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UBER TECHNOLOGIES, INC.;
23 OTTOMOTTO LLC; OTTO TRUCKING
24 LLC,

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Defendants.

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CASE NO. 3:17-cv-00939-WHA

**DECLARATION OF ANDY CRAIN IN
SUPPORT OF PLAINTIFF WAYMO
LLC'S SUPPLEMENTAL MOTION FOR
CONTINUANCE AND RESPONSE TO
REQUEST FOR INPUT ON PENDING
MOTION TO CONTINUE TRIAL DATE**

1 I, Andy Crain, hereby declare as follows.

2 1. I make this declaration of personal, firsthand knowledge, and if called and sworn as
3 a witness, I could and would testify competently as follows.

4 2. In my capacity as Vice President of Forensics and Collections at Discovia, I was
5 retained in this matter to provide additional forensic analysis of the various evidentiary sources
6 that were analyzed in the preparation of the Stroz due diligence report dated August 5, 2016. I
7 have also been asked to provide forensic analysis of an additional approximately 118 hard drives
8 that I am informed and believe were contained in various computers, servers, and storage arrays
9 belonging to Anthony Levandowski. It is my understanding that this latter batch of 118 hard
10 drives was disclosed to Stroz during its due diligence investigation, but was neither imaged nor
11 analyzed by Stroz (until just recently, when Stroz has begun to create forensics images of them in
12 work that remains ongoing, as discussed in greater detail below).

13 3. On September 25, 2017, I participated in a teleconference with Linda Brewer and
14 Jeff Miles from Quinn Emanuel; Melanie Blunschi and Whitney Weber from Latham and Watkins
15 for Stroz, and John Shumway and Aditi Tatti from Stroz's team. We discussed the high-level
16 inventory of all these evidentiary devices, the efforts Stroz was currently undertaking to create
17 forensic images of the latter batch of them, and the preliminary logistics and timing that would be
18 required to obtain access to this forensic data; i.e. from both the 56 previously-available devices
19 and accounts, as well as the 118 unreviewed drives.

20 4. It should be noted that the latter batch of approximately 118 servers and hard drives
21 is notably distinct and more difficult to image and analyze than ordinary laptops or other devices,
22 because these drives are apparently configured in what are called "arrays" -- essentially multiple
23 hard drives configured to function as one larger drive via the use of either, or both, hardware and
24 software. This technology is also commonly known as "RAID" (redundant array of inexpensive
25 disks).¹ Moreover, it is my understanding from speaking with the Stroz team that a good number
26 of these particular drives and arrays are of a non-typical variety, having presumably been

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1 configured by Mr. Levandowski himself. In order to perform forensic analysis on hard drives
2 contained in an array, it is necessary to first “reconstruct” or “rebuild” the array such that its file
3 system and substantive contents can be logically read and understood. This can be done by either
4 capturing the forensic image with certain, specific methodologies, or by virtually rebuilding the
5 array using forensic tools after images are captured of the individual RAID member drives. I can
6 attest based on prior experience that this type of RAID reconstruction can often become very
7 difficult and quite time consuming.

8 5. On Wednesday, September 27, 2017, Judge Corley ordered Stroz to produce to
9 Discovia all native images of both the 56 previously-reviewed devices and accounts and the 118
10 previously un-reviewed devices.

11 6. On Thursday, September 28, 2017, at 12:00 p.m. PST, Discovia received from
12 Stroz Friedberg 7 unique hard drives of data, containing 56 different evidentiary datasets
13 associated with five different custodians. We understand from Stroz that this is the universe of
14 devices and accounts that were analyzed in the preparation of its due diligence report dated August
15 5, 2016.

16 7. On October 1, 2017, I participated in another teleconference with counsel from
17 Quinn, counsel from Latham, and Stroz team member John Shumway. We discussed Stroz’s
18 ongoing efforts and progress to capture working forensic images of the additional 118 devices that
19 have not been reviewed (including the significant technical challenge of rebuilding the arrays, as
20 discussed above). Based on that call, I understand from Stroz that we can expect another delivery
21 of device images on Monday, October 2, 2017. We also discussed that it could still be one or more
22 weeks until they are able to provide the balance of these device images to Discovia in a usable
23 format, so that we can then begin our own analysis and review. It is also still possible that one or
24 more of Mr. Levandowski’s computers and/or storage arrays may simply not be able to be
25 properly reconstructed. On this call, Stroz clarified that some of Mr. Levandowski’s servers that
26 are still being worked on contain between 24 – 32 terabytes of storage, which is a highly unusual
27 type of computer in today’s civil litigation and forensic discovery.

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1 8. Although Quinn Emanuel began on September 23, 2017 attempting to get access
 2 to, and begin review on, the 56 previously-reviewed devices and accounts and the 118 previously
 3 un-reviewed devices at Stroz, as of October 1, 2017, Discovia has only had the 56 devices and
 4 accounts for 72 hours, and have hundreds if not thousands of man-hours to complete the needed
 5 forensic analysis in order to formulate conclusions relative to a variety of questions central to this
 6 case. For example, as discussed in greater detail below, each of these evidentiary datasets must be
 7 catalogued, have reporting generated about their contents, undergo a variety of semi-automated
 8 pre-processing by the appropriate forensic tools, and have their various forensic artifacts parsed
 9 and analyzed by human eyes, in close consultation with counsel.

10 9. Even though Discovia began its work immediately on the devices received from
 11 Stroz on September 28, 2017, there remains appreciable lag-time in getting access to the additional
 12 approximately 118 drives that apparently sat unexamined at Stroz since 2016.

13 10. The 56 device images received to date consist of approximately 8.5 terabytes of
 14 data, broken down by custodian roughly as follows: Anthony Levandowski (1.49TB); Don Burnett
 15 (5TB+); Soren Juelsgaard (617GB); Colin Sebern (567GB); and Ron Lior (859GB). Although
 16 comparisons between terabytes of data storage and things like documents or printed pages are by
 17 definition only rough measures, it should be stressed that 8.5 terabytes are a huge volume to try
 18 and process and analyze. For example, a single terabyte of storage is the mathematical equivalent
 19 of nearly 1,500 CD-ROM discs (which store 700MB each), meaning the data received from Stroz
 20 on September 28, 2017 would equal approximately 12,700 CD-ROMs full of information.

21 11. For the 8.5TB of data that was received by Discovia on Thursday, September 28,
 22 2017, we now must complete a host of tasks as part of the needed forensic analysis. A non-
 23 exhaustive listing of these types of tasks is below, along with rough estimated timelines:

- 24 (a) Conduct evidence intake and cataloguing, including chain of custody: **~25**
 hours of human labor;
- 25 (b) Prepare summary listings of the devices' files/folders serving various
 analysis purposes: **~25 hours of human labor;**

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- (c) Retrieve files of interest for counsel's review, based on the file/folder listings, e.g. source code: **~10+ hours of human labor**;
 - (d) Process evidentiary datasets using various forensics tools (as appropriate depending on what the dataset is, e.g. phone, Mac, Windows, etc.) in order to parse operating system artifacts, index the data for searching, and generate reporting: **~50-100 hours of human labor and an estimated 500 hours or more of machine run time**;
 - (e) Perform detailed manual analysis of parsed artifacts and various reporting, per device, in an effort to answer specific questions requested by counsel: **~300-500 hours or more of human labor**. This specific work step is especially difficult to estimate, as answering a single question on a single device can sometimes require time-consuming research, replication testing, and detailed discussions with counsel.

14 12. While we can do some of this work in parallel, gaining a degree of efficiency on
15 the machine run time, we are also constrained somewhat by our number of analysis computers and
16 forensic tool licenses, such that a good deal of these tasks must be done sequentially.

17 13. There will also be a large amount of additional time that will be needed to analyze
18 the data from the additional 118 computing devices that Stroz is currently imaging (i.e. once that
19 batch of data is even received by Discovia). The estimated time required to complete this
20 component is quite difficult to estimate, but could easily require **an additional 300-500 hours or**
21 **more of human labor.** The devices are not ready for review yet, nor has a definite timeline for
22 production been confirmed.

23 14. Stroz's counsel Ms. Blunschi has indicated during our conversations that the latter
24 batch of approximately 118 drives was not previously analyzed as part of the preparation of the
25 Stroz due diligence report, and consist of "home-made" servers designed by Anthony
26 Levandowski.

27 15. Because these servers have not been reviewed by Stroz previously there will be
28 more preliminary work to be done to discover what is held on these servers.

1 16. In the first 48 hours with access to the data for the 56 devices, Discovia had already
2 made discoveries that were not disclosed in the Stroz Report. For example, as part of our ongoing
3 analysis of the Levandowski MacBook laptop, we discovered there is a Windows XP Virtual
4 Machine (WVM) present there. A WVM is essentially a separate computer that is contained
5 within a large software file, and stored on the Macbook laptop: i.e. a computer within a computer.

6 17. The Levandowski WVN has outward-facing metadata showing that it was first
7 created in April 2010, and that it was last modified (i.e. used) on March 22, 2016, which is the
8 same day Stroz imaged the MacBook. This indicates that Mr. Levandowski was using the WVM
9 most recently on the same day his computer was imaged. Moreover, this particular type of virtual
10 computer file found on Mr. Levandowski's Macbook is more complex for us to penetrate and
11 analyze – we have that effort underway as well. With sufficient time, Discovia should be able to
12 prepare file/folder listings for this virtual computer, and conduct a variety of other analysis, just
13 like we are doing for the other datasets received from Stroz.

14 18. Discovia has been processing the devices to provide file-listings from each device
15 and account, which list out all of the files on each device or account, their size, and other basic
16 information about them.

17 19. We also began extracting source code material on Friday, September 29 which on
18 information and belief was ordered by Judge Corley during the Wednesday, September 27, 2017
19 hearing on the motion to compel the native image data. The batches of code contained in just the
20 Levandowski file listings alone is voluminous.

21 20. Similar to the file / folder listings, these batches of code are being extracted on a
22 rolling basis.

23 21. Moreover, we have various forensic tool processes running now against the
24 Levandowski Macbook image and other evidentiary datasets, so that we can try to answer
25 pertinent questions that were left unanswered in the Stroz report. This pre-processing tool work is
26 a necessary first step to conducting the analysis, as it identifies and parses the various artifacts we
27 use to formulate conclusions to those types of questions. These pre-processing steps can be time
28 consuming, however, sometimes requiring 12-24 hours or more to run (per evidentiary dataset).

22. Discovia is also investigating certain facts that were disclosed, but not fully explained or examined, by the Stroz Due Diligence Report.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

DATED: October 2, 2017

/s Andy Crain C

SIGNATURE ATTESTATION

Pursuant to Local Rule 5-1(i)(3), I attest under penalty of perjury that concurrence in the filing of this document has been obtained from Andy Crain.

/s/ Charles K. Verhoeven
Charles K. Verhoeven